Ions at the solution/vapor interface investigated by photoemission spectroscopy

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Ion-enhanced interactions with gases at aqueous interfaces may play an important role in the chemistry of concentrated inorganic solutions in the atmosphere. We have used ambient pressure photoemission spectroscopy to directly measure the concentration of ions at the surface of potassium iodide and potassium bromide solutions. We find that in both cases the surface composition of the saturated solution is enhanced in the halide anion concentration compared with the bulk of the solution. The degree of enhancement was found to depend on the polarizability of the anions. The results of our photoemissio spectroscopy measurements are in good qualitative agreement with classical molecular dynamics simulations.